REMARKS

The Office examined claims 1-4 and rejected claims 1 and 3. With this paper, the claims are amended as described below, but none are canceled or added, and so claims 1-4 remain in the application.

Rejections under 35 USC §102

At section 2 of the Office action, claims 1 and 3 are again rejected under 35 USC §102 as being anticipated by Boutros ("Signal Space Diversity: A Power- and Bandwidth-Efficient Diversity Technique for the Rayleigh Fading Channel").

Claims 1 and 3 both recite telecommunication using a signal constellation of symbols having a dimensionality that is at least four and is a multiple of two, where each symbol of the signal constellation corresponds to an ordered set of at least two sets of two or more numbers, and further wherein for each of the at least four-dimensional symbols, the modulator is configured to modulate the carrier signal using *in turn* each of the at least two corresponding sets of two or more numbers.

Thus, e.g. in case of a four-dimensional signal constellation, four bits are mapped (once) to four numbers which are then the coordinates of the symbol representing the four bits. Next, the first two coordinate numbers are used to modulate a carrier signal (e.g. two quadrature waves, i.e. a sine wave and a cosine wave), which is then transmitted, and then the second two numbers are used to modulate the carrier signal and then transmitted. This is what is intended by the recitation "*in turn*" in the claims, which applicant sees that the Office seems not to have taken into account in comparing the invention as claimed with the teachings of Boutros. After transmitting all four numbers of the four dimensional symbol, another four bits are mapped (once) to four numbers for a next four dimensional symbol, and so on.

More specifically for example, suppose the next four bits to be transmitted are 0010, which is value "2" in decimal. According to the invention in the embodiment shown in Fig. 3, the four numbers into which these four bits are mapped are as follows (see k=2 in Fig. 3):

$$\left(-\frac{1}{ab}R,-\frac{1}{ab}R,\frac{1}{a^2b}R,\frac{1}{a^2b}R\right).$$

According to the invention, the first two of these numbers are transmitted as if they resulted in a mapping of two bits to a two-dimensional symbol, and the second two of these numbers are transmitted as if they resulted from a second mapping of two bits to a second two-dimensional symbol. Thus, e.g. if QAM modulation is used, the first two of these numbers both modulate the respective carrier wave by multiplication (amplitude modulation) by the factor $-\frac{1}{ab}R$, and so on.

In contrast, Boutros teaches mapping two bits to two coordinate numbers representing a two-dimensional symbol, modulating a carrier wave with the two coordinate numbers, then mapping two more bits to two coordinate numbers to obtain a next two-dimensional symbol, and then modulating the carrier wave with the next two-dimensional symbol. Even if the second two bits are the same as the first, the mapping may be different because Boutros teaching rotating the symbol constellation.

Thus, Boutros differs from the invention as claimed in that Boutros performs twice as many mappings (of half as many bits) to symbols as in the invention. Therefore Boutros cannot be said to disclose the invention as claimed.

Accordingly, applicant respectfully requests that the rejections under 35 USC §102 be reconsidered and withdrawn.

Conclusion

For all the foregoing reasons it is believed that all of the claims of the application are in condition for allowance and their passage to issue is earnestly solicited.

Respectfully submitted,

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Date

James A. Retter
Registration No. 41,266

WARE, FRESSOLA, VAN DER SLUYS
& ADOLPHSON LLP
755 Main Street, P.O. Box 224
Monroe, CT 06468-0224

tel: (203) 261-1234
Cust. No.: 004955